

# MULTI-PHASE VOLTAGE CONTROLLED OSCILLATOR (VCO) WITH COMMON MODE CONTROL

## ABSTRACT

A voltage controlled oscillator ("VCO") circuit capable of generating signals with reduced jitter and/or low-phase noise is provided. One embodiment provides a plurality of cascaded VCO cells, where each VCO cell can include a source coupled differential pair, a bias transistor connected to the differential pair for biasing the differential pair, a resistive load pair connected to the differential pair, and a voltage controlled capacitor pair or varactor pair connected to the differential pair. The varactors provide control over the frequency of the oscillations produced by the VCO circuit in combination with a control voltage. A phase frequency detector combined with a charge pump and loop filter provide the control voltage.